

LAKE ANDES NATIONAL WILDLIFE REFUGE

Lake Andes, South Dakota

ANNUAL NARRATIVE REPORT
Calendar Year 1987

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LAKE ANDES, SOUTH DAKOTA

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CALENDAR YEAR 1987

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

LAKE ANDES NATIONAL WILDLIFE REFUGE

LAKE ANDES, SOUTH DAKOTA

ANNUAL NARRATIVE REPORT

Calendar Year 1987

<u>Bill Wilson</u>	<u>4/4/88</u>	<u>Jim Peterson</u>	<u>4/6/88</u>
Refuge Manager	Date	Refuge Supervisor Review	Date

<u>Ralph F. Fries</u>	<u>4/6/88</u>
Regional Office Approval	Date

LAK ANDES NATIONAL WILDLIFE REFUGE

CHARLES MIX COUNTY, SOUTH DAKOTA

R. 65 W. R. 64 W.

FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

UNITED STATES
DEPARTMENT OF THE INTERIOR

98° 32'

98° 30'

98° 26'

98° 24'



LEGEND

- STATE PUBLIC USE AREA
- FEE TITLE LAND

ANDES CREEK UNIT

NORTH UNIT

A N D E
CENTER UNIT

REFUGE HEADQUARTERS

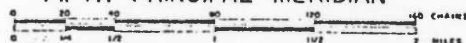
L A K E
SOUTH UNIT

OWENS BAY UNIT

R. 65 W. R. 64 W.

FIFTH PRINCIPAL MERIDIAN

Scale



4	3	2	1
5	4	3	2
6	5	4	3
7	6	5	4
8	7	6	5
9	8	7	6
10	9	8	7
11	10	9	8
12	11	10	9
13	12	11	10
14	13	12	11
15	14	13	12
16	15	14	13
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20	19	18	17
21	20	19	18
22	21	20	19
23	22	21	20
24	23	22	21
25	24	23	22
26	25	24	23
27	26	25	24
28	27	26	25
29	28	27	26
30	29	28	27
31	30	29	28
32	31	30	29
33	32	31	30
34	33	32	31
35	34	33	32
36	35	34	33
37	36	35	34
38	37	36	35
39	38	37	36
40	39	38	37

TOWNSHIP
DIAGRAM

MEAN
DECLINATION
1965

COMPILED IN THE BRANCH OF ENGINEERING
FROM SURVEYS BY THE U.S.F. & W. B.U.S.G.S.

MINNEAPOLIS, MINNESOTA

DEC., 1966

T. 97 N.
T. 96 N.

T. 97 N.
T. 96 N.

INTRODUCTION

Lake Andes, a 4,700 acre meandered lake, whose water level depends entirely upon annual runoff, lies in the south central portion of Charles Mix County, South Dakota. The lake, historically used as a campsite by Sioux hunting parties pursuing the migrant buffalo herds and waterfowl flock, was actually named after a French trader whose nickname was Andy. "Andy's Lake" was given its present title following the establishment, in 1900, of a town and post office.

The Lake Andes National Wildlife Refuge was established in 1936 by a Presidential Executive Order which authorized the purchase of 365 acres of land at Owens Bay. Subsequent land purchases have been made on a continuing basis, forming the Owens Bay Unit (832 ac.) and the Andes Creek Unit (410 ac.).

In 1939, the largest single easement ever taken from the state of South Dakota conveyed to the United States Fish and Wildlife Service the right to flood the meandered lakebed and maintain a closed Refuge for migratory birds and other wildlife.

Two dikes separate Lake Andes into three management units, however, the lack of a permanent water supply allows very little water level manipulation. The Owens Bay marsh (240 ac.), fed by natural runoff and the waters from a free-flowing artesian well, is managed using a system of periodic water level draw downs to produce optimum waterfowl brood rearing conditions, plus the production of natural waterfowl food.

A January 1973 outbreak of Duck Virus Enteritis killed 40,000 ducks and geese using the open water of Owens Bay. This unfortunate die-off prompted drastic changes in the Refuge's management, including the elimination of wintering waterfowl (using short periods of well shutdown and pyrotechnics) during the winter months and the elimination of food crops previously grown for the wintering flocks of ducks and geese. Nearly 300 acres of cropland were reseeded to native grass nesting cover and the area is now managed primarily for the production of waterfowl and various species of waterbirds. A multitude of birds and animals, indigenous to the prairie ecosystem, also utilize the Refuge.

INTRODUCTION

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A. HIGHLIGHTS

The winter of 1986-87 was one of the mildest on record while heavy rains in March raised Lake Andes over the dikes for the second year in a row (Section B.).

Waterfowl production was estimated to be 19% above 1986 (Section G.3).

Two hundred seventy five thousand pounds of bullheads were removed from Lake Andes by commercial netting (Section G.11).

Fishermen had excellent fall fishing for largemouth bass and yellow perch (Section H.9).

The Owens Bay shop was remodeled to make better use of the floor space and modernize the maintenance facilities (Section I.1).

B. CLIMATIC CONDITIONS

The winter of 1986-87 was like no other in the recent memory of local residents. Both man and wildlife enjoyed one of the warmest South Dakota winters on record. No snowfall was recorded during the month of January and only 2.5 inches fell during the February-April period. The lack of snow cover made temperatures in the fifties common. Not the typical South Dakota winter! Average snowfall for the January-April period for Pickstown is nearly 16 inches.

Large areas of Lake Andes were ice-free by the end of January. Ice conditions remained poor (maximum thickness, 10 inches) all winter. The lake was ice-free by March 1.

Statewide, February's recorded weather data was the second warmest, second driest, and second lowest snowfall since 1931. A local farmer was even seen disking on February 2.

As expected, wintering populations of wildlife came through the winter in excellent shape. The stage was set for one of the best ringneck pheasant nesting seasons in years.

During the last week in March heavy rains totaling 7.7 inches fell during a one week period that produced heavy runoff. Wetlands over much of southeast South Dakota already had excellent water levels. Once the water stopped running nearly all wetlands were brim full. The water level in Lake Andes rose nearly four feet over the normal high water elevation. On March 26, the north and south dikes were overtopped by water (for the second year in a row). Many roads in the

southern half of the district were blocked by high water. Suddenly it became a challenge just to visit WPAs in Douglas, Charles Mix and Aurora Counties.



Lake Andes water elevations peaked at nearly four feet over the set high water mark in April and flooded the dikes for the second year in a row.

87 NR 1

4-8-87 BTS

Conditions changed during April-June from very wet to very dry. Only 3.38 inches of precipitation fell during this period. Normal rainfall is 9.06 inches. Row crops that were not planted early in the season germinated poorly.

By the end of August water levels in Lake Andes had drained down to the set outlet level of 1437.25 msl.

Fall weather was beautiful. One shot of 4.13 inches of rainfall fell in September, but there was no runoff because of extremely dry soil conditions. Farmers had excellent conditions for the fall harvest and most crops were out by mid November. Farmers had ample opportunity to do fall tillage until 8 inches of snow fell on 12/23 and halted field work for the winter.

1987 climatic conditions recorded at Pickstown, SD.				
	Snowfall	Total Precipitation	Temperatures (F.)	
			High	Low
January	----	0.05	66	-4
February	2.5	1.08	70	16
March	----	7.70	81	11
April	----	0.87	88	23
May	----	1.25	91	39
June	----	1.26	98	49
July	----	4.26	102	50
August	----	2.16	99	41
September	----	4.13	91	42
October	----	0.37	85	20
November	----	1.16	67	20
December	8.0	1.17	66	-7
Totals	10.5	25.46		
Normals	25.2	21.37		

D. PLANNING

5. Research and Investigation

Lake Andes NR85 - Owens Bay Waterfowl Nesting Study

This study, started in 1985, was to determine the density, nesting success, and habitat preferences of upland nesting waterfowl on the Owens Bay Unit when nest predators were controlled. Trout Waterfowl Production Area was included in the study as a comparison area, but without predator control. It has similar habitat types.

Waterfowl nests were located using a cable-chain drag pulled by two four-wheel drive vehicles driving parallel through the cover. Two nest drags were completed, one starting on May 14 and another on June 8, 1987. Cover types searched on Owens Bay included 149 acres of native grass, 71 acres of brome/sweet clover DNC, and 40 acres tall wheatgrass/sweet clover DNC. On Trout WPA, 111 acres of native grass and 22 acres of brome/sweet clover DNC were nest searched. Twelve raccoons and 2 skunks were removed on the Owens Bay predator control unit prior to and during the nesting season.

A total of 181 nests were located on Owens Bay and 80 on Trout WPA. The most common nesting species was blue-winged teal comprising 58.2% of the nests (152). The remaining nests located were mallard (48), gadwall (47), shoveler (6), pintail (5), green-winged teal (2), and wigeon (1). For all species, nesting success was 48.0% Mayfield on Owens Bay versus 10.0% Mayfield on Trout WPA. This compares to 1986's finding of 44.8% and 22.1% respectively and 48.4% and 18.8% in 1985.

Nest densities for all species were the highest in brome/sweet clover DNC (1 per 0.94 acres) compared to native grass (1 per 1.46 acres). Blue-winged teal, mallard, and gadwall nest densities were the highest in DNC. Nest densities for these species were slightly lower in native grass. Similar preferences were found in 1986.

The total estimated costs to control predators on Owens Bay was \$591.25.

E. ADMINISTRATION1. Personnel

Lake Andes NWR staff (L. to R.) Back Row: 8, 7, 5, 1, 3, 4,
Front Row: 2, 11, 6, 9, 10

87 NR 2
8-10-87 BTS

Permanent

- | | | |
|----|--------------------------------------|---------------------------|
| 1. | Bill Wilson, GS 12 | Refuge Manager |
| 2. | Bruce T. Schoonover, GS 11 | Refuge Manager |
| 3. | John Jave III, GS 9. | Refuge Manager |
| 4. | Ejner Frandsen, WG 8 | Maintenance Worker |
| 5. | Pam Nagel, GS 6 | Refuge Assistant (Typing) |

Career Seasonal

- | | | |
|----|------------------------------------|---------|
| 6. | John L. Eldridge, WG 3 | Laborer |
| 7. | John Fuchs, Jr., WG 3. | Laborer |
| 8. | Leon E. Kirchhevel, WG 3 | Laborer |
| 9. | Eugene J. Slaba, WG 3. | Laborer |

Summer Temporary

- | | | |
|-----|--|----------------|
| 10. | Steve Krentz, GS 3 (5/10 - 08/28). . . . | Biological Aid |
| 11. | Richard Rolston, GS 3 (5/10 - 11/21) . . | Biological Aid |

Table 1. Lake Andes Complex staffing pattern, 1983-87

Year	Permanent		Temporary	Total FTE
	Full Time	Part Time		
1987	5	4	2	8.59
1986	5	4	4	9.38
1985	5	4	4	9.02
1984	5	4	1	8.15
1983	5	4	-	7.65

2. Youth Programs

The Lake Andes NWR Complex did not host a YCC program in 1987 because of YCC budget constraints.

4. Volunteer Program

A total of 30 volunteers worked 204 hours for the Lake Andes Complex. Habitat maintenance was the primary service. Most of our volunteers are farmers who keep the roadsides mowed on township roads which border WPAs.

5. Funding

The Lake Andes National Wildlife Refuge also administers the 20 county Lake Andes Wetland Management District and the Karl E. Mundt National Wildlife Refuge. Funding for both refuges and the district is consolidated within a single annual appropriation (Table 2).

Table 2. Annual appropriations and manpower levels since 1983, Lake Andes National Wildlife Refuge Complex.

Fiscal Year	O&M Budget	BLHP Budget	Large ARMM's Project	Manpower S/D
1987	301,000	--	27,000	2,260
1986	278,000	--	63,000	2,343
1985	330,000	--	41,000	2,221
1984	230,000	--	66,000	2,120
1983	227,000	45,000	--	1,990

6. Safety

Monthly safety meetings were held in conjunction with personnel from the local Soil Conservation Service office. Some of the subjects included pesticide poisoning, treatment of accident victims, boating safety, the correct use of fire fighting equipment and defensive driving.

Refuge personnel attended a defensive driving course at the Public Health Hospital in Wagner, SD on June 25-26. Personnel that needed training from the Madison WMD also attended.



Members of the refuge staff were certified on various pieces of equipment by Berle Meyers from Sand Lake NWR on July 13-14.

87 NR 3
7-13-87 BTS

One lost time incident occurred in 1987. Biological Aid Steve Krentz was lost from work for a total of 60 hours. He had contracted a case of tularemia. At first it was thought that he had a case of pesticide poisoning. On July 17, 1987, Steve had been spraying weeds on various WPA's in the district with 2,4-D ester. On this particular day the temperature was in the high 90's and his pickup began over-heating. He turned off the air conditioner and opened the window. This apparently allowed vapors to enter the cab of his truck.

Monday morning, July 20, Steve called in and said he was not feeling well and would not be in for that day. He visited a physician on Monday afternoon. The doctor did not give a

positive diagnosis, but indicated it could be a toxic reaction to the chemical. Steve missed a half day on Tuesday and visited the doctor again on Wednesday, July 22. A chest X-ray was taken on that visit and a small spot was found on his left lung that was thought to be a result of pesticide fumes. The doctor indicated it would take two or three days to clear up and he would be fine.

Steve returned to work, but continued to feel poorly into the month of August. He still continued to experience occasional flu-like symptoms.

In August, Manager Wilson attended a disease workshop taught by Dr. Locke and Dr. Windingsted in conjunction with the Project Leaders meeting at Quivira NWR, KS. He noted in the discussion about the disease tularemia, that many of the symptoms in humans were similar to those that Steve was experiencing. Steve was then asked to be tested for tularemia. It turned out positive. It was not pesticide poisoning. Lake Andes Refuge had experienced a summer die-off of cottontail rabbits and the disease was diagnosed as tularemia. The disease can be contracted by humans from rabbits, contaminated water, or flies and ticks in the area. Steve probably contracted the disease while working on the refuge waterfowl nest drag study.

A lesson to be learned from this is that employees with unusual health problems should make doctors aware of their profession and any possible contacts with diseased wildlife.

The safety aspects of our pesticide spraying program was examined more closely after the Steve Krentz incident. Several new pieces of equipment including disposable coveralls, latex gloves, rubber boots and new respirators were purchased for the program. In addition, the last purchase of 2,4-D was in 2.5 gallon containers instead of 30 gallon drums. This should eliminate some of the steps in handling and reduce spills.

7. Technical Assistance

Assistant Refuge Manager Schoonover met with ASCS in Canton, SD about a drainage commencement determination in Lincoln County on November 9, 1987. The land owner's case was based on the evidence that he had started work on the drainage before the December 23, 1985 date outlined in the Farm Bill and was seeking full benefits. The landowner provided the review board with various documents proving that the project had begun before the magic date and Schoonover agreed with the land owner.

Refuge Manager Wilson met with the SCS on November 25, to examine the proposed drainage of a type III wetland in Yankton

County to make a minimal effect determination. The FWS did not agree that drainage of the wetland would have a minimal effect on the biological environment of the area.

Assistant Refuge Manager Jave accompanied Nel McPhillips of the Pierre ES Office on an inspection of a Corps of Engineers project proposal to straighten the mouth of Randall Creek below Ft. Randall Dam. The area is used by wintering bald eagles. It was determined the project would have little effect on the eagles habitat, but would help solve erosion problems in the Corps campground.

F. HABITAT MANAGEMENT

1. General

Nineteen eighty-seven was a good year for wildlife on the Lake Andes Refuge. Early spring precipitation and unseasonably warm temperatures caused refuge grasslands to prosper. This set the stage for excellent nesting conditions for waterfowl and upland game.

Dryer weather during May, June, and July slowed the response by warm season natives to spring short term grazing treatments. The lack of soil moisture resulted in poor germination on one of the refuge milo food plots and replanting was necessary. As a result the seed never matured.

2. Wetlands

Lake Andes is a 4730 acre meandered lake whose water level depends entirely upon annual runoff. Two dikes cut the lake into three units, the North, Center, and South. Stoplog water control structures are located within each dike. The lack of a permanent water supply precludes any water level manipulations.

In 1986, Lake Andes filled for the first time since 1962 and remained at full pool elevation through the winter of 1986-87. A mild, open winter allowed ice-out on Lake Andes on March 1. The open winter with little snow resulted in almost no runoff from snowmelt. Three inches of rainfall on March 15-21 raised all pools to the elevation of 1438.91 feet msl. On March 26, the North and South dikes were covered with water. Additional heavy rainfall raised the lake elevation to a peak of 1441.09 feet msl on April 3. The excess water continued to drain through the outlet structure until it reached the set high water mark of 1437.25 feet msl on September 1. The lake elevation at freeze-up was 1436.8 feet msl.

Lake Andes habitat conditions in 1987 remained very similar to those of 1986. The rapid increase in water levels in 1986 drowned out approximately 95% of the cattail stands and

eliminated much of the production of submergent vegetation. In 1987, submergent species recovered somewhat but, production was far below average because of the deep water conditions. Waterfowl production on the refuge has been severely limited by the lack of pair and brood habitat.

The Owens Bay Unit is a 240 acre marsh, separated by a dike from the South Unit of Lake Andes. A stoplog water control structure is located in the dike to allow water releases into Lake Andes. Owens Bay, in addition to water from natural runoff, is maintained by a free flowing artesian well which has a 800-1000 gpm flow and water right.

On March 16, a gradual draw-down was begun on Owens Bay. The artesian well flow was lowered and cycled through the prairie ponds into Lake Andes. Owens Bay had not been drawn down since 1973-74. Since then it had been held at full pool when possible. By September the bay had drained as low as possible, but 150 acres of 6"-8" deep sheet water still remained. It was impossible to completely drain the main pool, because of a sediment buildup in front of the outlet and high water elevations in Lake Andes, without blasting a trench or using specialized equipment to dig a trench. Owens Bay will be flooded in 1988.



Owens Bay was drawn down as much as possible to winter kill the existing bullhead population as well as improve waterfowl habitat.

87 NR 4
9-28-87 BTS

3. Forests

A 8 row shelterbelt approximately one half mile long was planted on the southeast side of Owens Bay. The shelterbelt was planted at the request of Charles Mix County to serve as a living snow fence for the adjacent county road. It should also provide excellent habitat for wintering wildlife populations.



A new shelterbelt was planted on Owens Bay to trap snow and provide winter habitat.

87 NR 5
4-22-87 BTS

4. Croplands

Following the 1973 DVE outbreak, the objectives of the Lake Andes NWR were changed from providing a wintering area to waterfowl production. Nearly 300 acres of cropland were seeded to nesting cover. Small foodplots are now planted for resident wildlife. A milo-oats/sweet clover rotation is used. No insecticides are used in the farming operation. The herbicide 2,4-D is used when needed on the milo plots. The refuge experimented with planting 3.5 acres of soybeans as a wildlife food crop in 1987. We experienced very high winter usage by pheasants and deer. Soybeans seem to remain upright and do not drift in with snow as bad as other crops.

Table 3. Farming program, Lake Andes NWR, 1987

Area	Crop	Acres
North of Exp. Tree Plot	Soybeans	3.5
Owens Bay 10-2	Blackbird resistant Milo	14.0
Owens Bay F2 (N 1/3)	Oats/sweet clover	10.0
Owens Bay F2 (S 2/3)	Blackbird Resistant Milo	23.0
SCS Tree Plot		2.0
		52.5



Food plots are planted force account on Owens Bay to benefit resident wildlife.

87 NR 6
10-1-687 BTS

5. Grasslands

Refuge grasslands are generally managed in one of three ways; controlled grazing, burning, and haying. These treatments are used to reduce invader species such as Kentucky bluegrass and smooth brome from the native grass areas. Treatments are also applied to prevent the accumulation of mulch that restricts new growth.



This re-established native grass field had been
grazed at 1 AUM/acre during May and . . .

87 NR 7
6-12-87 BTS



. . . The response by warm season natives was
tremendous.

87 NR 8
9-25-87 BTS

7. Grazing

Grassland units G-1c and 13b were control grazed in 1987 (49 acres). Unit G-1c is a 40 acre re-established native grass unit seeded in 1977. Unit 13b is a brome unit invaded with Russian olive trees. This grassland was grazed with 1 AUM/acre from late April to June 1. The post-graze vegetative response of the native species was delayed by lack of precipitation in June. Late summer rainfall caused the growth of warm season species to explode. However, since growth had been delayed the seed failed to mature. The graze was designed to stress cool season invaders such as brome and Kentucky bluegrass during their critical growing period, reducing competition for the more desirable warm season natives.

8. Haying

Portions of three DNC units (13a, 13a4, and G-2 totaling 57 acres) were hayed in 1987. All were hayed by a refuge permittee in late July. Two of the DNC units consist of tall wheat grass, alfalfa and sweet clover and provide heavy, dense upright nesting cover. Nest drag studies indicated that this DNC mix gets far more waterfowl nest initiations the season following a haying treatment when regrowth is 8-12 inches high.



Unit G-II was also light disked to invigorate the root-bound brome and stimulate the alfalfa. In August this unit was interseeded with alfalfa in an effort to increase the legumes in the stand.

87 NR 9

8-4-87 BTS

9. Fire Management

No prescribed burns were conducted and no wildfires occurred on the Lake Andes NWR during 1987.

10. Pest Control

The refuge conducts a noxious weed control program in accordance with South Dakota state law. The primary noxious weeds on Lake Andes Refuge are Canada and musk thistle. Spot spraying with 2,4-D on trouble areas has proven semi-effective in reducing these pest species. Charles Mix County is currently experiencing a wet cycle and we have seen a dramatic increase in thistles in the county.

11. Water Rights

The Lake Andes NWR has a 1000 gpm water right from the South Dakota Division of Water and Natural Resources for the Owens Bay artesian well. This water is used to flood 13 acres of the Prairie Pond Complex and supplement Owens Bay water levels. During periods of high water the well can be shut down. During periods of draw down the water is diverted into Lake Andes.

G. WILDLIFE

1. Wildlife Diversity

The secondary goal of the Lake Andes NWR management program is wildlife species diversification, superseded only by waterfowl production. The refuge program is aimed at providing a prairie ecosystem that will support a variety of wildlife species indigenous to the grassland habitat type. Since the prairies were historically maintained by large grazing herbivores, such as buffalo, and by prairie wildfire, controlled grazing and burning are used today in an attempt to re-create these natural conditions.

2. Endangered and/or Threatened Species

Wintering bald eagles are annual visitors to the Lake Andes NWR. They are attracted by large concentrations of migratory waterfowl and wintering resident wildlife populations on Owens Bay. The birds use a grove of mature cottonwood trees along the shoreline of the South Unit of Lake Andes for their night roost. Up to 8 birds used the roost during January, but numbers were highly variable. This was down from 16 bald eagles in 1986.



Bald eagles often pause on spring migration to hunt the shoreline of Lake Andes for winter-killed fish.

87 NR 10 JJ

3. Waterfowl

Up to 4,000 Canada geese and 3,000 mallards took advantage of the mild, snow free January weather to alternately use Lake Andes and the Missouri River. As the ice fishing activity picked up on Lake Andes, the birds tended to use Owens Bay and the river more.

The first spring migrants were 300 pintails seen on Johnson's Bay on February 13. This was about 10 days earlier than normal. An estimated 7,000 Canada geese (peak number), 10,000 mallards, 350 common goldeneye and 200 common mergansers also arrived on the 13th. The first gadwalls arrived on March 3 and blue-winged teal did not show up until March 31. The Lake Andes duck population for the spring migration peaked at 19,850 ducks on March 3. Mallards, pintails, redheads and scaup were the primary species present during this peak.

The coordinated Annual Mid-Continent White-Fronted Goose Survey that was to be conducted on March 17 was rained out. However, a total of 685 white-fronts were sighted in the vicinity of the refuge from February 27 to March 19.

Lake Andes participated in the Mid-Winter Waterfowl Survey in early January. The State of South Dakota normally does an aerial survey of Lake Andes for this count. This year most geese were feeding in the surrounding fields and the State

failed to get a count. Our census indicated 2,800 Canadas on the refuge on 1/8.:

A breeding pair count was conducted by airboat on Lake Andes and Owens Bay during May. The total number of breeding pairs was 787, up 57% from 1986 and very similar to 1985. The most common nesting species were blue-winged teal, mallard, and gadwall. In 1987, no redheads were counted on the spring pair counts. The high water conditions have drowned out nearly all stands of emergent vegetation used for nesting sites. This compares to a high of 292 pairs of redheads in 1983. Lake Andes should, however, provide good habitat conditions long after most habitat off refuge goes dry.



No redheads nested on Lake Andes in 1987 because emergent vegetation had been drowned out by deep water.

87 NR. 11 JJ

Waterfowl production is estimated by using nest drag data and the breeding pair count (Table 4). An estimated 1,656 ducklings were produced in 1987. This represents a 20% increase in production from 1986. The increase was due to better habitat conditions on Lake Andes.

Table 4. Estimated waterfowl production, by species, on the Lake Andes NWR, 1987.

Species	Pairs	Estimated Production	% of Pop.	% Change From 1986
Blue-winged Teal	292	657	37.0	+ 12
Mallard	213	479	27.0	+136
Gadwall	150	338	19.0	+131
Pintail	53	119	7.0	+141
Wood duck	52	117	6.6	+136
Shoveler	18	41	2.3	+ 80
Ruddy	4	9	0.5	- 60
Green-winged Teal	3	7	0.4	
Scaup	1	3	0.1	
Wigeon	1	3	0.1	
Totals	787	1773		

October waterfowl populations on Lake Andes peaked for the month on October 28 with 15,075 ducks and 35 geese. Primary species included 6,400 mallards, 2,825 scaup, 1,800 ruddy ducks, and 1,350 redheads. Approximately 500 canvasbacks used the North Unit. October populations of diver species were about half of normal. On November 9, a major influx of birds moved into the area. Refuge populations peaked at 30,000 mallards and 18,000 snow geese. Up to 8,000 snow geese and 15,000 mallards remained in the area until December 10 when weather conditions forced them to migrate.



A peak of 18,000 snow geese used Lake Andes in November. The number of snow goose use days has been trending upward.

An unusual sighting of a pair of old squaw was made on Lake Andes on December 15 by Schoonover and Jave.

4. Marsh and Water Birds

Up to 2,000 double crested cormorants and 500 white pelicans paused during their spring migration to dine on fish in Lake Andes.

Colonial nesting birds are censused annually on Lake Andes for the Colonial Bird Register. The survey was conducted on July 29, and the following species were censused: black-crowned night herons - 275 nests, cattle egrets - 125 nests, snowy egrets - 40 nests, great egrets - 20 nests, and great blue herons - 12 nests. The number of black-crowned night heron nests was down from the estimated 360 nests in 1986. Most likely because of the excellent habitat available off-refuge. No eared grebes nested on the refuge in 1987 because of the lack of suitable nesting habitat. Also, we normally have approximately 50 pairs of western grebes that nest on Lake Andes, but in 1987 less than 10 pair nested on the North Unit. All species except the western grebes nest in one large colony located in flooded Russian olive trees in Johnson's Bay.



A colony of five different species of marsh birds nested in flooded Russian Olive trees in Johnson's Bay on Lake Andes.

87 NR 12
7-29-87 BTS

5. Shorebirds, Gulls, Terns and Allied Species

The high water levels flooded new upland areas around Lake Andes. As water levels receded throughout the summer, extensive mudflats were exposed that provided ideal habitat for numerous species of shorebirds. Killdeer, lesser yellowlegs, long billed dowitcher's and several species of sand pipers were the most common. Other species sighted on Lake Andes in 1987 included ring-billed and Franklin's gulls, common snipe, common and black terns, American avocet and Wilson's phalarope.

6. Raptors

A variety of raptors are attracted to the refuge each year by the high pheasant populations and abundant small mammals and rodents. Species recorded in 1987 included red-tailed hawks, rough-legged hawks, sharp-shinned hawks, Coopers' hawks, ferruginous hawks and northern harriers. Great horned owls and screech owls use the refuge for nesting. Short-eared owls are rare visitors.

Injured wildlife is often turned into the refuge. During the year one rough-legged hawk that had been hit by a vehicle was turned in. It was successfully released after a period of rehabilitation.

Sightings of golden eagles are common during the winter months on Owens Bay as they are attracted by the high populations of resident wildlife.

7. Other Migratory Birds

Mourning doves remain one of the most prolific nesting species on the refuge. Excellent nesting habitat is provided in refuge shelterbelts and the SCS tree plot. Nesting success was likely higher than normal this year due to the lack of wet, windy weather during the spring and summer.

8. Game Mammals

The wintering population of white-tail deer was estimated to be 50-60 on Owens Bay. This is down from the record high 159 head censused in 1986. The mild winter was probably responsible for the decline. The South Dakota Game, Fish and Parks has also tried to reduce deer numbers in this county by increasing the harvest.

10. Other Resident Wildlife

The ring-necked pheasant is easily the most popular of our local wildlife species. Hundreds of out-of-state sportsmen

are drawn to the state annually to pursue this colorful gamebird.

The wintering population of pheasants on Owens Bay was estimated to be 300-400 birds. This was down from 1986 because of the previous poor nesting season. In 1987, pheasant nesting success in Charles Mix County was above normal due to the warm, early spring and lack of heavy thundershowers. This factor along with the predator reduction program on the refuge improved the 1987 population to an estimated 1,000 birds going into the winter.



Greater prairie chickens have been on the increase in the vicinity of the refuge the last few years. They periodically use the Owens Bay Unit.

87 NR 14 JJ

A single wild turkey hen that took up residency on Owens Bay in 1986 was commonly sighted. Now she needs an available tom.

Lake Andes Refuge did not participate in the 1987 Audubon Christmas Bird Counts because of staff commitments during the holidays. It is hoped that local birders will organize the count for 1988.

11. Fisheries Resources

Fisheries winter kill on Lake Andes was of no concern during the winter of 1986-87. Clear ice, little snow, and early ice-out resulted in high dissolved oxygen levels throughout the winter. Lake Andes has a reputation for winter kill because of normally shallow water depths and high amounts of aquatic vegetation.

Fisheries surveys in 1986 indicated that 90% of the biomass in the North Unit and 65% of the Center Unit was composed of black bullheads. The result was virtually no recruitment of largemouth bass, yellow perch, or bluegill because of the predatory activities of the large bullhead population. Commercial harvesting of the bullheads was one of the few feasible management options. A commercial fishing contract was issued by the Game, Fish and Parks Department to Jack Raw whose business is based in Minnesota, to remove 675,000 lbs. of bullhead per year for the next three years. During 1987, 275,000 lbs. of bullheads were removed by commercial netting (pocket nets) from the Center and South Units of Lake Andes. Outlets for the fish included wholesale fish markets and "pay to fish" businesses in Indiana, Ohio and Missouri.

Fish stocking in Lake Andes in 1987 included 100,000 northern pike fingerlings (Center Unit) on May 15 and 100,000 bluegill fingerlings on September 1. Fifty thousand were stocked in each of the Center and South Units.



Bluegills being stocked in the Center Unit of Lake Andes.

87 NR 15
9-1-87 BTS

A fish die-off occurred on Lake Andes in July. It was apparently due to an oxygen shortage caused by an extended period of extremely hot weather combined with a heavy algae bloom. Many young-of-the-year bass and perch were lost.



High water temperatures combined with an algae bloom resulted in a partial fish summer kill on the South Unit of Lake Andes in August.

87 NR 16 JJ

Personnel from Valentine FAO completed a fisheries survey on August 25-27. Electrofishing, and frame and gill nets were used to collect the fish samples. They found that the bullhead biomass was down slightly from 1986 and the recruitment for this species was extremely low. Apparent conclusions were that largemouth bass represent as much as a quarter of the fish biomass in the North and Center Units. They also found that recruitment was good for bluegill and yellow perch. It seems that fish populations in Lake Andes are in much better shape than the 1986 survey indicated. The partial summer kill was not significant enough to change the fish composition. Carp were also increasing in numbers, but still represent a very small portion of the biomass present.

Owens Bay was drawn down during the summer of 1987 to kill the existing fish population and increase its attractiveness to waterfowl. In 1988 northern pike, largemouth bass and perch will be stocked in the 270 acre marsh. Once established, this population will be used as a stocking source as needed for Lake Andes.

Another recommendation was to place a 15 inch size limit on largemouth bass in Lake Andes. This was suggested to the South Dakota Game, Fish and Parks Department, but was not implemented for 1988.

15. Animal Control

Waterfowl nest predators were controlled for the fourth year on the Owens Bay Unit. Control was limited to the native grasslands on the north side of the bay, an area with a traditionally high waterfowl nest density. Control was directed at raccoons and skunks, the primary nest predators identified during a three year nesting study. Tomahawk live traps, baited with sardines and chicken eggs were used prior to and during the waterfowl nesting season. Trapping was begun on February 19 and ended July 17. A total of 12 raccoons and 2 striped skunks were caught. All target species were dispatched. No non-target species were affected by the control program.

17. Disease Prevention and Control

Periodic disease monitoring trips are made over Lake Andes each year. An outbreak of botulism was discovered on Owens Bay on August 20. Specimens sent to the National Wildlife Health Lab for diagnosis confirmed the cause as Type C botulism. The refuge crew picked up and incinerated 598 dead birds by September 15 when losses ended with the onset of cooler weather. Waterfowl mortality due to botulism on Lake Andes is rather common with recent outbreaks in 1984 and 1985. Table 5 gives a summary of the birds collected by species.

Table 5. Waterfowl and bird species collected during botulism outbreak on Owens Bay, 1987.

SPECIES	NUMBER PICKED UP
Blue-winged Teal	192
Mallard	143
Green-winged Teal	87
Pintail	72
Coot	42
Unknown duck species	33
Gadwall	14
Shoveler	7
Yellowlegs	5
Sandpiper species	2
Wigeon	1
	<hr/> 598

The principle attributing environmental factor responsible for the die-off was that Owens Bay had been drawn down. The unit could not be drained completely because the outlet was slightly higher than pool bottom leaving approximately 100 acres of up to 10 inch deep water. Extremely hot weather during this period probably created anaerobic conditions favorable for the botulism bacteria.

In June, a cottontail rabbit, one of many found dead on the refuge, was submitted to the Veterinary Science Diagnostic Laboratory at South Dakota State University for a diagnostic examination. The laboratory results indicated that the rabbit had tularemia.



The refuge cottontail rabbit population crashed in June when an epidemic of tularemia swept through the population.

87 NR 17 JJ

H. PUBLIC USE

1. General

Lake Andes attracts fishermen, waterfowl hunters and wildlife enthusiasts from all across the State. Many of these people stopped at headquarters to ask for information and took the opportunity to view the displays and talk about the refuge.

2. Outdoor Classrooms - Students

The refuge saw a decrease in visits from local school systems in 1987. The high water in Lake Andes flooded the dikes making access difficult. The nature trail was also inundated for one half its length. The headquarters basement is used to house our interpretive items and is used for refuge talks. The basement was flooded during much of the spring and summer. Interpretive displays were damaged and displays had to be stored in high and dry locations.

Several talks both off and on the refuge, slide programs, and tours were given during 1987. Table 6 summarizes refuge programs.

Table 6. Lake Andes NWR Complex I & R Programs given during 1987.

Date	Program	Attendance
03/27	Jave had a booth at the Marty Science Fair about wildlife.	150
05/18	Schoonover presented a program about the refuge to the Wagner Elementary School, Third Grades.	60
05/26	Jave presented a program about birds to Armour Elementary School, First Grade.	15
05/26	Jave gave a program about the refuge to the Ravinia Cub Scouts.	7
06/15	Jave gave a program about the refuge to Lake Andes Cub Scouts.	7
07/13	Jave gave a program to the Wagner Girl Scouts about the refuge.	12
07/15	Schoonover gave a program to the Wagner Rotary Club about Lead poisoning and steel shot.	35
10/26	Schoonover presented a program to the White Lake Sportsmans Club about WPA management.	30
11/02	Jave presented a program to the Lake Andes Boy Scouts about waterfowl.	12

4. Interpretive Foot Trails

The Owens Bay nature trail and picnic area is open to the public year around. These facilities have experienced an increase in visitation because of the improved fishing on Lake Andes. Unfortunately, nearly half of the nature trail, which was constructed in the mid-1970's, has been flooded by the high Lake Andes water levels. About 75 yards of boardwalk, which is the most popular part of the trail, was constructed below the high water mark and is now partially submerged or floating. There won't be much left once winter ice action takes its toll. A new boardwalk above the high water mark will be constructed as soon as water levels recede. In the mean time an alternate route has been developed.

6. Interpretive Exhibits/Demonstrations

The headquarters office and a kiosk on the site serve as the primary contact station. Mounted specimens, interpretive displays, and a System 70 display are housed in the headquarters basement. This area is used to show films to visiting school groups and refuge orientations.

In 1987 the refuge manned a booth with display at the Charles Mix County Mid-Winter Fair in Lake Andes on January 20 and 21. Approximately 850 people attended the fair and viewed the exhibit. The FWS display was on loan from Waubay NWR.



Nagel and Jave staffed an exhibit concerning refuge programs at the annual Charles Mix County Fair.

87 NR 18
1-20-87 BTS

8. Hunting

The Center Unit of Lake Andes, which consists of 2,000 acres is open to hunting. Duck season opened on October 3 and closed November 22. Habitat conditions were similar to 1986, and most early migrants preferred to utilize small wetlands off-refuge rather than the open water type habitat that Lake Andes provided. Hunting pressure on Lake Andes is generally light with most gunners preferring to pass shoot from the dikes that border the Center Unit. The bag usually consists of diver species with a few gadwalls and northern shovelers.

Lake Andes traditionally provides excellent decoy hunting for mallards and divers once the small wetlands have frozen. However, for the last few years Lake Andes has remained ice-free until well after the waterfowl season has closed. Local gunners have missed most of the "prime time" for late season corn field shooting. Part of Charles Mix County is in a special late zone which opens and closes two weeks later than the rest of the State. Efforts are being made to move Lake Andes into this zone. The late zone was set up to take advantage of late migrating mallards along the Missouri River. Flight patterns have changed during recent years because of agricultural cropping trends. Irrigated corn fields are now planted bordering the huge reservoir in the north central part of South Dakota. Ducks and geese have no reason to migrate because they have refuges, food, and open water that does not freeze until late December-early January.

Steel shot was required for all waterfowl hunting in South Dakota in 1987. Compliance with the regulation was good in the Lake Andes area.

Deer and pheasant hunting was not possible on the Center Unit of Lake Andes in 1987, the only area open to hunting. The thick cattails and kochia that once harbored pheasants and deer in the lake bed is now covered with open water.

The Owens Bay portion of the refuge has a reputation with local deer hunters for sheltering big bucks. This area (823 acres) is closed to all hunting and is bordered on three sides by gravel roads. During the deer season there is a steady procession of pickup trucks trying to catch a trophy white-tail outside the boundary fence.



Traffic by the refuge really picks up once deer season opens as hunters hope to catch a buck like one of these outside the refuge boundary.

87 NR 19 JJ

9. Fishing

Fishing had flashes of excellence on Lake Andes during 1987. Ice fishermen were slowed by unstable ice conditions in January and February. But, the Johnson's Bay area of Lake Andes was hot for large yellow perch and bluegill until early February when ice conditions deteriorated. In March and April fishing success was slowed by the flooded conditions on the lake. Summer bass fishing was good at times, but did not really peak out until September. The North Unit provided super fishing for largemouth bass up to two pounds. Perch fishing really took off in November on the Center Unit. Anglers made some outstanding catches with 13-14 inch "hogs" common. The South dike was packed with fishermen and it became an obstacle course just to travel the dike.



Happy summer anglers on Lake Andes.

87 NR 20 JJ



Ice fishing for perch was excellent at times on Lake Andes.

87 NR 21
1-16-87 BTS

14. Picnicking

The Owens Bay picnic area is always popular with local residents. Fishermen who bring their family to Lake Andes often use the area for family oriented recreation and cookouts.

17. Law Enforcement

Two dikes cross Lake Andes, dividing the lake into three units. The Center Unit is open to hunting in accordance with the terms of the easement from the State granting the U.S. Fish and Wildlife Service the right to manage the lake as a migratory refuge. The North and South Units are closed to hunting and trapping, but open to fishing and boating. Most waterfowl hunting consists of pass shooting off the dikes.

Most of the law enforcement load on Lake Andes is handled by State Conservation Officers. One notable catch by the local CO was that of two men fishing on the North dike with 17 largemouth bass over their legal limits. This was a result of a TIP phoned in to our office. Total fines and State civil assessments amounted to \$1,985.00.

The mail box and rail fence at headquarters was vandalized during the night of March 3, 1987. The mail box had been intentionally pushed over by a car and was found lying in the middle of the road. They did the same to three sections of the rail fence. The estimated damage was \$100.00. The incident was reported to the County Sheriff, but no leads ever developed.



Vandals did an estimated \$100 damage to the rail fence and mail box at headquarters in March.

87 NR 22
3-4-87 JJ

In June, Manager Wilson attended a Charles Mix County Commissioners meeting to discuss complaints about fishermen blocking the dike roads with their parked vehicles. Farmers occasionally have difficulty traveling the dike roads with their large implements. Fishermen are limited to parking on one side only, but unfortunately a few individuals don't mind taking up more than their share of the roadway. As a compromise, "No Parking" signs were placed on both sides of the bridges to lessen the vehicle congestion in those areas.

The South Unit of Lake Andes was re-posted with refuge boundary signing in August and September. Many of the signs on this 2,000 acre unit had been destroyed by vandals and ice-action through the years.

The status of Fish and Wildlife Service owned uplands around the North Unit of Lake Andes was changed from "Refuge" to "WPA". These properties were purchased with money from the Migratory Bird Conservation Fund, but closed to help maintain the integrity of the North Unit Refuge. It was determined that closing these lands to public access had little effect on waterfowl use on the area. The North Unit properties were posted as such in September. The lake bed up to the set high water elevation remained in refuge status.

FOC's were issued to two Sioux Falls men for hunting ducks out of season in late November on Lake Andes. One paid while the other requested his case be heard in Federal Court. Jave traveled to Sioux Falls during January 1988 for the hearing. Guilty as charged.

Managers Schoonover and Jave attended the 40 hour law enforcement refresher course in Grand Island, NE on March 16-20, 1987. Wilson, Schoonover and Jave also attended a law enforcement coordination meeting and qualified with their firearms in Sioux Falls on September 16-17, 1987.



Region 6 employees receiving firearm instruction at the 40 hour law enforcement refresher in Grand Island, NE.

87 NR 23
3-18-87 BTS

I. EQUIPMENT AND FACILITIES

2. Rehabilitation

The Owens Bay shop, constructed in 1967 was designed prior to the era of fuel shortages and high energy prices. The building was of uninsulated cement block construction with uninsulated doors. In 1981, the east bay of the building was rehabed by force account. Improvements included insulating the walls and installing a suspended ceiling. A new heating system and fluorescent lights were also installed.

A \$27,000 Large ARMM's project was initiated in 1987 to remodel the Owens Bay shop to include a modern vehicle service bay, carpentry shop, welding shop and crew room. The following improvements were made by force account except where noted:

- a six inch insulated plywood partition wall was constructed to divide a 50' x 50' vehicle storage area into two bays 30' x 50' and 20' x 50'.
- The ceiling was insulated to R-26 with a system of fiberglass batts between the purlins and an outside fiberglass layer with plastic vapor barrier. The system was hung from the purlins with clips and rollers.

- steel insulated overhead fiberglass doors were installed in the vehicle service and carpentry bays (installation contracted).
- new wiring, outlets and overhead fluorescent lighting system.
- the side walls were insulated with six inches of fiberglass and faced with blandex and painted.
- a new propane radiant heating system.
- five metal walk-through doors (installation contracted).
- the partition wall was covered with painted steel siding in the vehicle service bay.
- the east bay was divided into a welding area and a crew room with new personnel lockers.
- concrete footing poured to support the vehicle lift.



A insulated ceiling was installed force account as part of a large ARMMs project to modernize the Owens Bay shop.

87 NR 24
6-9-87 BTS



A cement approach was poured at the entrance to the vehicle service bay.

87 NR 25
9-25-87 BW

A 16' x 48' overhead floor was constructed for storage in the seven stall building. Shelving and a safety railing were installed around the perimeter. A variety of small refuge equipment, signs, biological items, etc. are stored in this area.

3. Major Maintenance

The stoplog outlet structure for Lake Andes began leaking in January. It was temporarily repaired by replacing the top few stoplogs and plugging leaks. In September lake levels had lowered to where water was not running over the stoplogs. A double set of new 4 inch by 6 inch stoplogs were installed. Future plans are to construct a permanent cement structure with outlet gate.



New stoplogs were placed in the Lake Andes outlet structure in September.

87 NR 26
10-1-87 BTS



Rotted wood siding was repaired on the headquarters 3-stall garage and a new rain gutter was installed.

87 NR 27
10-1-87 BTS

Four water control structures on the Prairie Ponds system on Owens Bay were retrofited with new screw gates. Channels in the concrete stoplog structures were deteriorating.

The refuge supplied a dump truck and driver to assist Charles Mix County in re-graveling the dikes across Lake Andes that had been damaged by flooding.

Broken windshields were replaced in five vehicles during the year.

4. Equipment Utilization and Replacement

A 300 gallon low profile pickup mounted sprayer was purchased during the year to update our aging pesticide spraying equipment. The unit has a 5 hp motor, 28 foot boom and electric remote sprayer control. It is hoped this new unit will reduce the exposure to pesticides by the user and increase efficiency.

Additional equipment acquired during the year, some of which were purchased with the \$27,000 Large ARMM's project monies included:

- ten 72 inch steel personal lockers.
- vertical mounted two stage air compressor with 80 gallon tank.
- twin post surface mounted electric hydraulic 9000 lb vehicle hoist.
- John Deere 16 hp lawn tractor with 50 inch mid mower with grass catcher attachment.
- John Deere 21 inch, 3.5 hp push mower.
- three 1000 gallon underground fuel storage tanks.
- Canon 300 mm f4.5 lens.
- Soil Mover 5 yard scraper.
- one mile of polywire electric fence with posts and two chargers for holistic grazing management.



This new John Deere 316 riding lawn mower will be used to maintain the headquarters and shop facilities.

87 NR 28
9-1-87 BTS

One vehicle was replaced during 1987. A new 1987 Dodge three quarter ton pickup was received in April to replace a 1979 Datsun King Cab pickup. Both the Datsun pickup and a 1978 Dodge Ramcharger 4x4 were transferred to the SDSU Coop Unit in Brookings, SD. The refuge will take delivery on a new Chevy Blazer 4x4 sometime in 1988 to replace the Ramcharger.

5. Communications Systems

Three new General Electric 100 watt mobile radios and two portables with chargers were purchased during the year. The mobile units permit refuge, state, and county frequencies to be combined in one unit. The new radios were placed in vehicles used for law enforcement. The old system consisted of one radio for the refuge frequency and one state radio in each vehicle. The portable units were purchased to be used for fire management. Prior to this we had only two portables that could be used on the fire line.

8. Other

An old excess 1800 sq. ft. wooden storage building on Owens Bay was sold to the high bidder for \$106.00. The building was moved and the site cleaned up by December. This building had been used for storage and to house the carpentry shop.



Excessed storage building was moved intact to its' new home.

87 NR 29
12-3-87 BTS

The refuge office had water in the basement during the spring/summer due to high water levels in Lake Andes. A sump pump that was installed in 1986 could not keep up. The water soaked carpet was declared a total loss and removed. All furniture and stored items were removed from the water as much as possible. Many items mildewed. Once things dried up a dehumidifier was put into operation. Future plans are on hold until we see what 1988 brings for water levels in Lake Andes.

J. OTHER ITEMS

1. Cooperative Programs

The experimental FWS/SCS tree plot on Owens Bay continues to draw interest from numerous State and Federal agencies. Not only do the trees provide data on species vigor and hardiness, but they also create excellent wildlife food and cover. The FWS accomplishes the between-row cultivation, while planting and in-row cultivation is done by the SCS.

3. Items of Interest

Jave attended a Holistic Management Course in Albuquerque, NM on April 6-10 and Schoonover in Grand Junction, CO on June 14-21.

Zone Supervisor, Jim Matthews, and Ron Shupe were at the refuge May 18-22 for an operations inspection.

Wilson attended the semi-annual regional inter-agency meetings at Pickstown in May and October.



Ejner Frandsen was presented his 20-year length of service pin and certificate in August.

87 NR 30
8-31-87 BTS

Wilson and Jave attended the Project Leaders meeting and disease workshop at Quivira NWR on August 17-20.

Nagel attended the administrative workshop held in Denver on October 26-30.

Wilson and Schoonover participated in a joint meeting during October between the FWS, SD Game, Fish and Parks, the Charles Mix County Commissioners, and concerned citizens regarding the future of Lake Andes.

Jim Gillette (WO) visited the refuge on October 19 while in the area bird hunting.

Two weed meetings were attended with county representatives. Jave attended a meeting in Miller on November 10 and Schoonover in Plankinton on November 13.

Wilson met with the Restore Lake Andes Association to discuss methods to keep water in Lake Andes, primarily in the South Unit.

Jave and family moved into the refuge residence from Pickstown after Wilson moved to his newly acquired farm in November.



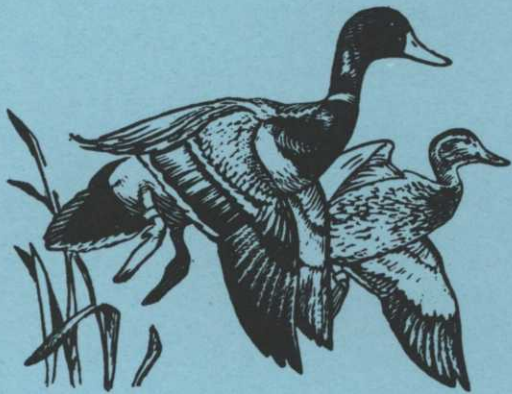
Wilson and Schoonover attended a grassland tour in the Rainwater Basin hosted by Manager Trout and crew.

87 NR 31
9-16-87 BTS

4. Credits

Nagel wrote Section E.1, and E.5, typed and assembled the report. Schoonover wrote Section F.13. Jave wrote the remainder of the document. Wilson edited and provided moral support.

Birds of the



Lake Andes

**NATIONAL WILDLIFE
REFUGE COMPLEX**

LAKE ANDES, SOUTH DAKOTA

The Lake Andes Complex consists of the Lake Andes National Wildlife Refuge, the Karl E. Mundt National Wildlife Refuge and the Lake Andes Wetland Management District.

Lake Andes NWR is managed as a waterfowl production refuge and contains the 4,700 acre lake, plus the Owens Bay and Andes Creek Units, 832 and 410 acres respectively. The Karl E. Mundt NWR provides a sanctuary for a wintering bald eagle flock, protecting 780 acres of river bottomland roost sites with an additional 300 acres of woodlands protected by perpetual easement. Over 20,000 acres of waterfowl habitat are preserved and managed within the 20 county Lake Andes WMD. The District also contains 83,000 wetland acres protected from drainage by perpetual easements with the landowners.

The best opportunities for bird watching on the Lake Andes Refuge and District are between April 1 and October 15. The Karl E. Mundt Refuge is closed to the public to prevent disturbance of the wintering bald eagles. The bald eagles can be easily observed from adjacent Corps of Engineers land from November 1 to March 1.

BIRDS OF THE LAKE ANDES NWR COMPLEX

This bird list contains 213 species that have been recorded on or near the Lake Andes NWR Complex. The list is in accordance with the 6th A.O.U. Check-list. New names are used where applicable. Species known to nest on the Complex are marked with a •. Season and abundance are coded as follows:

S—Spring—March-May

S—Summer—June-August

F—Fall—September-November

W—Winter—December-February

a—abundant

c—common

u—uncommon

o—occasional

r—rare

LOONS

— Common Loon o

GREBES

— • Pied-billed Grebe c u a
— Horned Grebe u u
— Red-necked Grebe o o
— • Eared Grebe u u u
— • Western Grebe u u

PELICANS

— American White Pelican c c c

CORMORANTS

— Double-crested Cormorant c c c

HERONS AND BITTERNS

— • American Bittern u u u
— Least Bittern u u u
— Great Blue Heron c u c
— Great Egret o
— Snowy Egret o
— Little Blue Heron o
— Green-backed Heron (Green Heron) o o o
— • Black-crowned Night-Heron c c c
— Yellow-crowned Night-Heron r r r

IBISES

— White-faced Ibis o o o

WATERFOWL

— Tundra Swan (Whistling Swan) o o
— Greater White-fronted Goose c c
— Snow Goose u u
— Canada Goose u a u a
— • Wood Duck o r o r
— • Green-winged Teal a u a o
— American Black Duck o u o o
— • Mallard a u a a
— • Northern Pintail a u a o
— • Blue-winged Teal a a a
— Cinnamon Teal o o o
— • Northern Shoveler c c c
— • Gadwall a c a r
— • American Wigeon a o a o
— • Canvasback c o c
— • Redhead c o c
— • Ring-necked Duck c c r
— Greater Scaup o o
— • Lesser Scaup a o a r
— Oldsquaw r
— White-winged Scoter o o
— Common Goldeneye u o u o
— Bufflehead u u r
— Hooded Merganser o o
— Common Merganser u c
— Red-breasted Merganser u u
— • Ruddy Duck c u c

	S	S	F	W
VULTURES				
—• Turkey Vulture	o	o	o	
HAWKS AND FALCONS				
— Osprey	o	r	o	
— Bald Eagle	o		o	a
—• Northern Harrier (Marsh Hawk)	c	c	c	r
— Sharp-shinned Hawk	o		o	
— Cooper's Hawk	o		o	
— Northern Goshawk	o		o	
— Red-shouldered Hawk	o	u	o	
— Broad-winged Hawk	o	u	o	
—• Swainson's Hawk	o	o	o	
—• Red-tailed Hawk	o	u	o	
— Ferruginous Hawk	o		o	o
— Rough-legged Hawk	o	r	o	c
— Golden Eagle				o
—• American Kestrel	c	c	c	
— Merlin	o		o	
— Peregrine Falcon	o		o	
— Prairie Falcon	o		o	
GALLINACEOUS BIRDS				
—• Gray Partridge	u	u	u	u
—• Ring-necked Pheasant	a	a	a	a
—• Greater Prairie-Chicken	o	o	o	o
—• Sharp-tailed Grouse	o	o	o	o
—• Wild Turkey	u	u	u	u
—• Northern Bobwhite (Common Bobwhite)	u	u	u	u
RAILS				
— Virginia Rail	o	o	o	
—• Sora	u	u	u	
—• American Coot	c	c	c	r
CRANES				
— Sandhill Crane	u		u	
SHOREBIRDS				
— Black-bellied Plover	o		o	
— Lesser Golden-Plover (American Golden Plover)	o		o	
— Semipalmated Plover	c	o	c	
— Piping Plover	o	o		
—• Killdeer	c	c	c	
— American Avocet	u	o	u	
— Greater Yellowlegs	c	o	c	
— Lesser Yellowlegs	c	o	c	
— Solitary Sandpiper	o		o	
— Willet	o	o	o	
—• Spotted Sandpiper	o	o	o	
—• Upland Sandpiper	o	o	o	
— Hudsonian Godwit	o		o	
— Marbled Godwit	u	u	u	
— Ruddy Turnstone	o		o	
— Sanderling	o		o	
— Semipalmated Sandpiper	o	o	o	
— Least Sandpiper	c	o	u	

	S	S	F	W
— White-rumped Sandpiper	o	o	o	
— Baird's Sandpiper	u	o	u	
— Pectoral Sandpiper	u	o	u	
— Stilt Sandpiper	o	o	o	
— Buff-breasted Sandpiper	o	o	o	
— Long-billed Dowitcher	c	o	c	
— Common Snipe	o	r	o	
— Wilson's Phalarope	c	o	u	
— Red-necked Phalarope	o		u	
GULLS AND TERNS				
— Franklin's Gull	c	a	c	
— Bonaparte's Gull	o		o	
— Ring-billed Gull	u	u	u	
— California Gull	u		u	
— Herring Gull	u	o	u	r
—• Common Tern	c	c	o	
—• Forster's Tern	u	u	u	
— Least Tern	o	o		
—• Black Tern	c	a	c	
DOVES				
— Rock Dove	o	o	o	o
—• Mourning Dove	a	a	a	r
CUCKOOS				
—• Black-billed Cuckoo	o	o		
—• Yellow-billed Cuckoo	o	o		
OWLS				
—• Eastern Screech-Owl	c	c	c	c
—• Great Horned Owl	c	c	c	c
— Snowy Owl				u
—• Burrowing Owl	o	o	o	o
— Long-eared Owl	o	o	o	r
— Short-eared Owl	o	o	o	r
GOATSUCKERS				
—• Common Nighthawk	u	u	o	
SWIFTS				
— Chimney Swift	c			
HUMMINGBIRDS				
— Ruby-throated Hummingbird	o			
KINGFISHERS				
— Belted Kingfisher	u	u	u	
WOODPECKERS				
—• Red-headed Woodpecker	c	c	c	
— Red-bellied Woodpecker	u	u	u	u
— Yellow-bellied Sapsucker	u	o	u	
—• Downy Woodpecker	u	o	u	c
—• Hairy Woodpecker	u	o	u	c
—• Northern Flicker (Common Flicker)	c	c	c	
FLYCATCHERS				
— Olive-sided Flycatcher	o		o	
— Least Flycatcher	o			

	S	S	F	W
— Eastern Phoebe	o	o		
— • Western Kingbird	c	c	c	
— • Eastern Kingbird	c	c	c	
LARKS				
— Horned Lark	c	o	c	a
SWALLOWS				
— • Purple Martin	o	o	o	
— • Tree Swallow	c	c	c	
— • Northern Rough-winged Swallow	o	o	o	
— • Bank Swallow	c	c	c	
— • Cliff Swallow	c	c	c	
— • Barn Swallow	c	c	c	
CROWS AND JAYS				
— • Blue Jay	c	c	c	o
— • Black-billed Magpie	c	c	c	c
— • American Crow	c	c	c	c
CHICKADEES				
— • Black-capped Chickadee	o	o	o	o
NUTHATCHES				
— White-breasted Nuthatch	u	o	u	o
CREEPERS				
— Brown Creeper	u	u	u	u
WRENS				
— • House Wren	c	c		
— • Sedge Wren (Short-billed Marsh Wren)	c	c	u	
— • Marsh Wren (Long-billed Marsh Wren)	c	c	u	
KINGLETS AND THRUSHES				
— Golden-crowned Kinglet	r	r		
— Ruby-crowned Kinglet	r	r		
— Eastern Bluebird	o	u		
— Swainson's Thrush	o	u		
— • American Robin	c	c	o	r
MOCKINGBIRDS AND THRASHERS				
— • Gray Catbird	u	c		
— • Brown Thrasher	u	c		
PIPITS				
— Water Pipit	u	u		
WAXWINGS				
— Bohemian Waxwing	r	r	o	o
— Cedar Waxwing	r	r	o	o
SHRIKES				
— Loggerhead Shrike	o	o	o	
STARLINGS				
— • European Starling	c	c	c	c
VIREOS				
— Warbling Vireo	o	o		
— Philadelphia Vireo	o	o		
— Red-eyed Vireo	u	u		

WOOD WARBLERS

	S	S	F	W
— Tennessee Warbler	u		u	
— • Yellow Warbler	c	c		
— Magnolia Warbler	r		r	
— Yellow-rumped Warbler	c		c	
— Blackpoll Warbler	u		c	
— American Redstart	r			
— Black-and-white Warbler	r	r		
— Ovenbird	r	r		
— Northern Waterthrush	o	o		
— • Common Yellowthroat	c	c	o	
— Yellow-breasted Chat	r	r		

GROSBEAKS AND SPARROWS

	S	S	F	W
— Northern Cardinal	r	r		r
— Rose-breasted Grosbeak	c	c	c	
— Blue Grosbeak	r	r		
— Lazuli Bunting	r	r		
— Indigo Bunting	r	r		
— Dickcissel	c	c	u	
— Rufous-sided Towhee	u	u		
— American Tree Sparrow	c		o	r
— • Chipping Sparrow	c	c	o	
— • Clay-colored Sparrow	u	u		
— Vesper Sparrow	o	o		
— Lark Sparrow	u	u	o	
— Lark Bunting	u	u		
— • Savannah Sparrow	c	c		
— • Grasshopper Sparrow	u	u		
— • Song Sparrow	c	a	o	r
— Lincoln's Sparrow	o			
— White-throated Sparrow	u	o		
— White-crowned Sparrow	u	o		
— Harris' Sparrow	u	o		
— Dark-eyed Junco	u	o	c	
— Lapland Longspur				c
— • Chestnut-collared Longspur	c	u	u	
— Snow Bunting				o

BLACKBIRDS AND ORIOLES

	S	S	F	W
— • Bobolink	c	c		
— • Red-winged Blackbird	c	c	o	r
— • Eastern Meadowlark	c	a	o	o
— • Western Meadowlark	c	a	o	c
— • Yellow-headed Blackbird	c	c	o	
— Rusty Blackbird	u	u	u	
— Brewer's Blackbird	u	u	u	
— • Common Grackle	c	c	o	o
— Brown-headed Cowbird	c	c	o	
— • Orchard Oriole	c	c		
— • Northern Oriole	u	u		

FINCHES

	S	S	F	W
— • American Goldfinch	c	c	o	o
— Evening Grosbeak	o		o	u

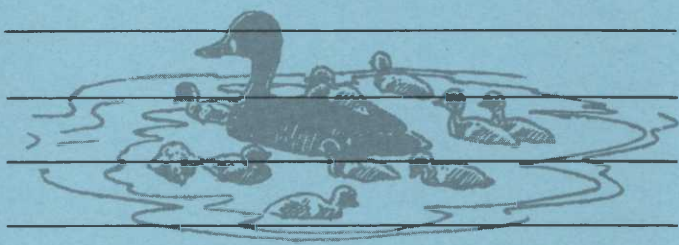
WEAVER FINCHES

	S	S	F	W
— • House Sparrow	c	c	c	c

For additional information, contact the Refuge Manager, Lake Andes National Wildlife Refuge Complex, R.R. #1, Box 77, Lake Andes, S. Dakota 57356. Telephone: (605) 487-7603.

The Lake Andes National Wildlife Refuge Complex is one of a system of refuges administered by the U.S. Fish and Wildlife Service and dedicated to the preservation of wildlife. The financial base for this system was established in 1934 through the passage of the Migratory Bird Hunting Stamp Act. This Act requires waterfowl hunters to purchase annually a migratory bird or "duck stamp." Funds collected from duck stamp sales have been used to purchase numerous refuges that provide habitats necessary to sustain a variety of wildlife for both hunters and nonhunters to enjoy.

Notes



U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

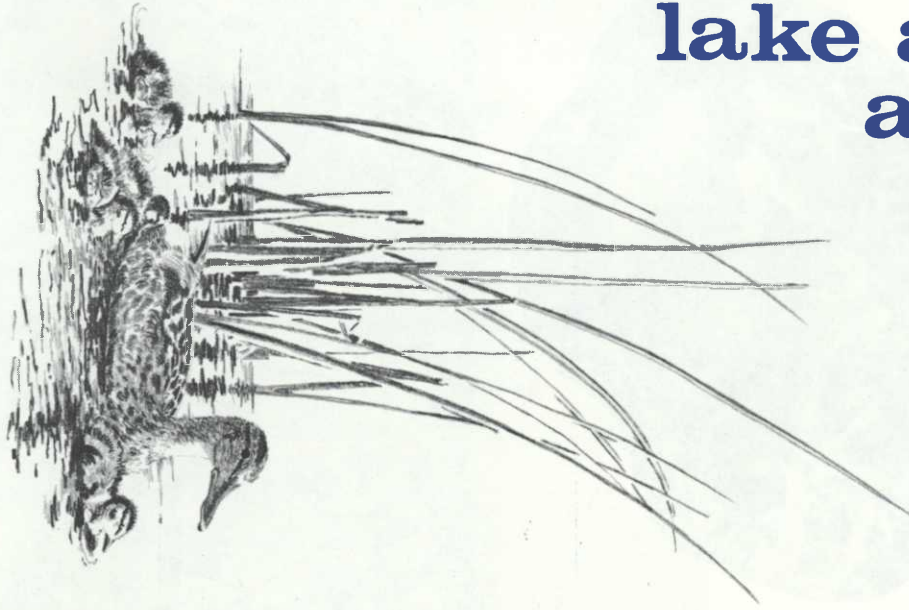


RF6-64550-2

GPO 838-986

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lake andes refuge and wetlands management district



Uniqueness: Lake Andes, with its 4700 acres of open water interspersed with marsh vegetation, represents a unique piece of wetland preserved for the production of ducks and a variety of waterbirds. The lake's importance during migration seasons must also be noted, as countless thousands of waterfowl utilize the marshlands during wet years. The Owens Bay Unit, an 832-acre refuge containing a 240-acre marsh surrounded by over 450 acres of native grass cover, plus the 320-acre Youngstrom Unit provide additional wildlife habitat adjacent to Lake Andes.

Over 20,000 acres of waterfowl production areas, small potholes nestled amongst the native prairie grasses, are intensively managed and operated under the Lake Andes Wetlands Management District. This 20-county district is the largest of its kind in South Dakota. An additional 80,000 wetland acres within the District are also protected from drainage via perpetual landowner easements.

History: Lake Andes is a natural, intermittent prairie lake, whose water supply depends entirely upon annual run-off. Lake levels periodically rise and fall, with the entire lake going dry approximately once every 20 years.

The lake, historically used as a campsite by Sioux hunting parties pursuing the migrant buffalo herds and waterfowl flocks, was actually named after a French trader whose nickname was Andy. "Andy's Lake" was given its present title following the establishment, in 1900, of a town and post office.

The refuge was established in 1936 by a Presidential Executive Order which authorized the purchase of 365 acres of land at Owens Bay. Subsequent land purchases have been made on a continuing basis.

In 1939, the largest single easement ever taken from the State of South Dakota conveyed to the United States Fish and Wildlife Service, the right to flood the meandered lake bed and maintain a closed refuge for migratory birds and other wildlife.

A 1958 Congressional Amendment to the Duck Stamp Act, plus additional authorization of funds in 1961 under the Wetlands Loan Act, provided the necessary legislation to carry on an accelerated wetlands habitat preservation program in South Dakota.

Cover: a mallard brood - Drawing, I. Grenier. Upper left: a young ruddy duck - U. S. Fish and Wildlife Service photo by C. J. Henry. Lower left: a pair of ring necked pheasants - U. S. Fish and Wildlife Service photo by Kent Olson. Center: Canado goose landing - Drawing, I. Grenier. Upper right: Upland sandpiper - Drawing, I. Grenier. Lower right: small group with wetlands manager learning about wetlands areas - U. S. Fish and Wildlife Service photo by Kent Olson.



Management: Two dikes separate Lake Andes into three management units, however the lack of a permanent water supply allows very little water level manipulation. The Owens Bay marsh, fed by the waters from a free flowing artesian well, is managed using a system of periodic water level drawdowns to produce optimum waterfowl brood rearing conditions, plus the production of natural waterfowl food.

A January, 1973 outbreak of Duck Virus Enteritis killed 40,000 ducks and geese using the open water of Owens Bay. This unfortunate die-off prompted drastic changes in the Unit's management program, including the shutdown of the artesian well during the winter months and the elimination of food crops previously grown for the wintering flocks of ducks and geese. Over 350 acres of cropland were re-seeded to native grass nesting cover and the area is now managed primarily for the production of waterfowl and various species of water birds.

Several small food plots and a series of shelterbelts have been planted at Owens Bay and received extensive use by resident white-tailed deer, ring-necked pheasants, plus a wide variety of small mammals and song birds.

Nesting cover on the waterfowl production areas is managed by periodic grazing, haying, or controlled burning programs. Annual surveys determine waterfowl response to the various management techniques. Small check dams are often constructed to create additional marshland, while food plots and shelterbelts are planted on many of the areas.

Public Opportunities: Wildlife observation, hunting and fishing are the major attractions of Lake Andes during the wet years. Visitors interested in wildlife observation can expect to find nearly any species of bird or mammal indigenous to the prairie pothole country. The spring and fall migrations offer the greatest diversity of species, however colony-nesting eared grebes, black terns, and Franklin's gulls create a summer spectacular for bird watchers. When suitable water depths are present, the entire lake offers good fishing for northern pike, perch, and bass. Although only the center unit of Lake Andes is open to hunting, duck and goose hunters find multitudes of waterfowl in the marshy habitat, while pheasant and deer hunters pursue their quarry along the wooded perimeter of the lake.

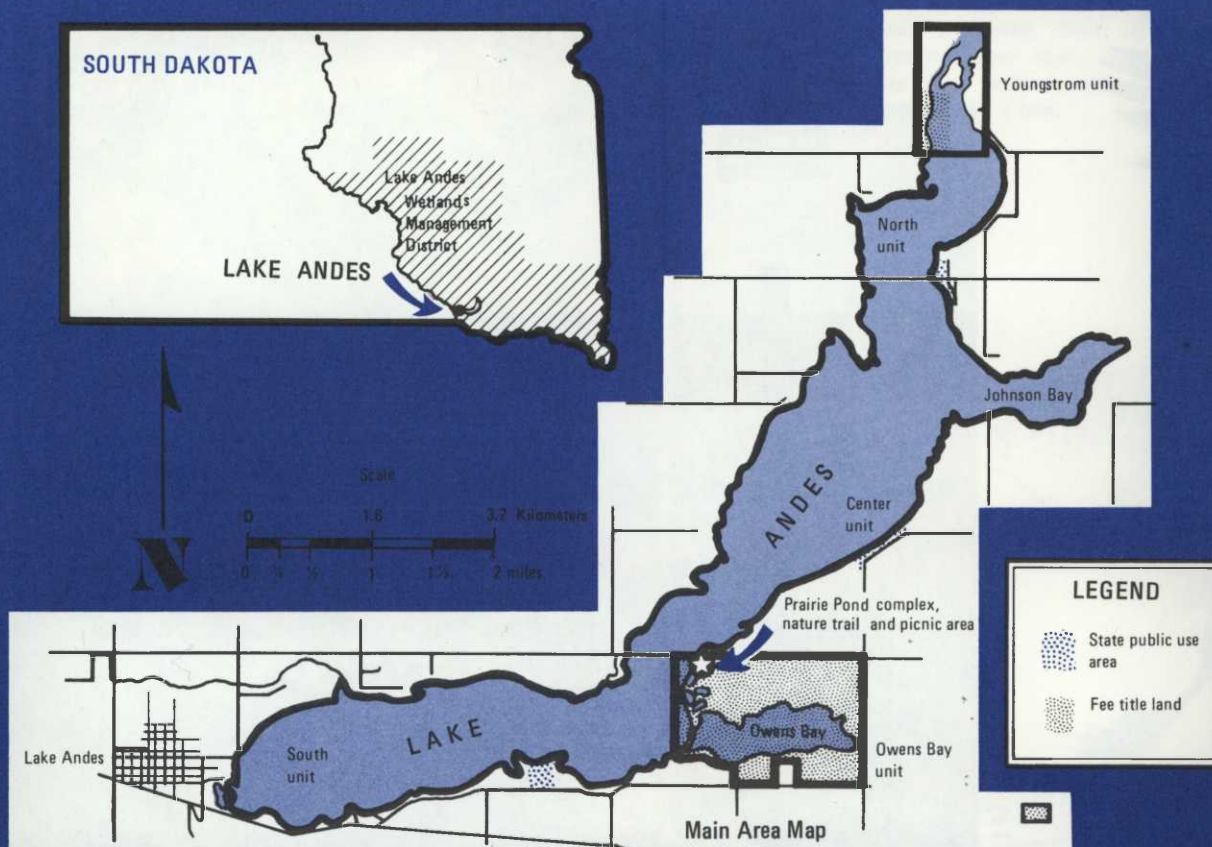
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A GATHERING OF WATERBIRDS

Lake Andes - Owens Bay		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
GREBES	5 species			●	●	●	●	●	●	●	●		
PELICANS	white				●	●	●	●	●	●	●		
CORMORANTS	double-crested			●	●	●	●	●	●	●	●	●	
GEESSE	canada	●	●	●	●	●				●	●	●	●
	snow			●	●	●				●	●		
	white-fronted			●	●	●				●	●		
DUCKS	mallard Δ *	●	●	●	●	●	●	●	●	●	●	●	●
	pintail Δ		●	●	●	●	●	●	●	●	●	●	
	gadwall Δ			●	●	●	●	●	●	●	●		
	shoveler Δ			●	●	●	●	●	●	●	●		
	blue-winged teal Δ *			●	●	●	●	●	●	●	●		
	redhead Δ		●	●	●	●	●	●	●	●	●	●	
	lesser scaup Δ		●	●	●	●	●	●	●	●	●	●	
	ruddy duck Δ			●	●	●	●	●	●	●	●	●	
HERONS	4 species			●	●	●	●	●	●	●	●		
RAILS	virginia Δ			●	●	●	●	●	●	●	●		
	sora Δ			●	●	●	●	●	●	●	●		
	coot Δ			●	●	●	●	●	●	●	●	●	
GULLS	5 species		●	●	●	●	●	●	●	●	●	●	

● period of occupancy
 Δ refuge nester
 * most common nesting duck
 # may peak at 100,000 during fall



A picnic area located at the northwest corner of the Owens Bay unit is open during daylight hours from April 15 through October 15. A mile-long nature trail originates at the picnic area and meanders along the wooded lake shore, across marshlands in the Prairie Pond complex, and returns via the native grass uplands. Early morning or late afternoon walks along the nature trail offer visitors views of elusive white-tailed deer, gaudy ring-necked pheasant, broods of blue-winged teal, or bobolinks singing from territorial perches in the grassland. Guided tours are available to organized groups, however prior arrangement must be made with the refuge manager.

The waterfowl production areas are open to the public on a year-round basis, although hunting is restricted to applicable South Dakota season dates and bag limits. Overnight camping and fires are prohibited on all waterfowl production areas.

Vanishing Prairies: Three distinct vegetative zones are found throughout the Wetland Management District. The tall grass prairie zone encompasses the four eastern counties, with dominant grasses being big bluestem, indiangrass, little bluestem, and switchgrass. The tall grass/mixed prairie transition zone covers the central portion of the District and hosts stands of western wheatgrass, big bluestem, side-oats grama, and porcupine grass. The western portion of the District falls within the mixed grass prairie zone, with dominant grasses being western wheatgrass, blue grama, and needle and thread grass.

As the trend toward increased agri-business continues, the destruction of the native prairie and its glacier-built potholes seems inevitable. The waterfowl production areas within the Lake Andes, Wetland District will serve as monuments to a forgotten era, where future generations can still reflect upon the uniqueness of the prairie environment. The sight of waist-high grasses waving in the wind, complemented by a beautiful array of prairie wildflowers, plus a ragged wedge of ducks passing over a cattail-lined pothole, will form indelible memories of that which once flourished across South Dakota.

*For further information contact the Refuge Manager,
Lake Andes NWR and Wetlands Management District,
Lake Andes, South Dakota.*

**U.S. Fish and Wildlife Service
Department of the Interior**

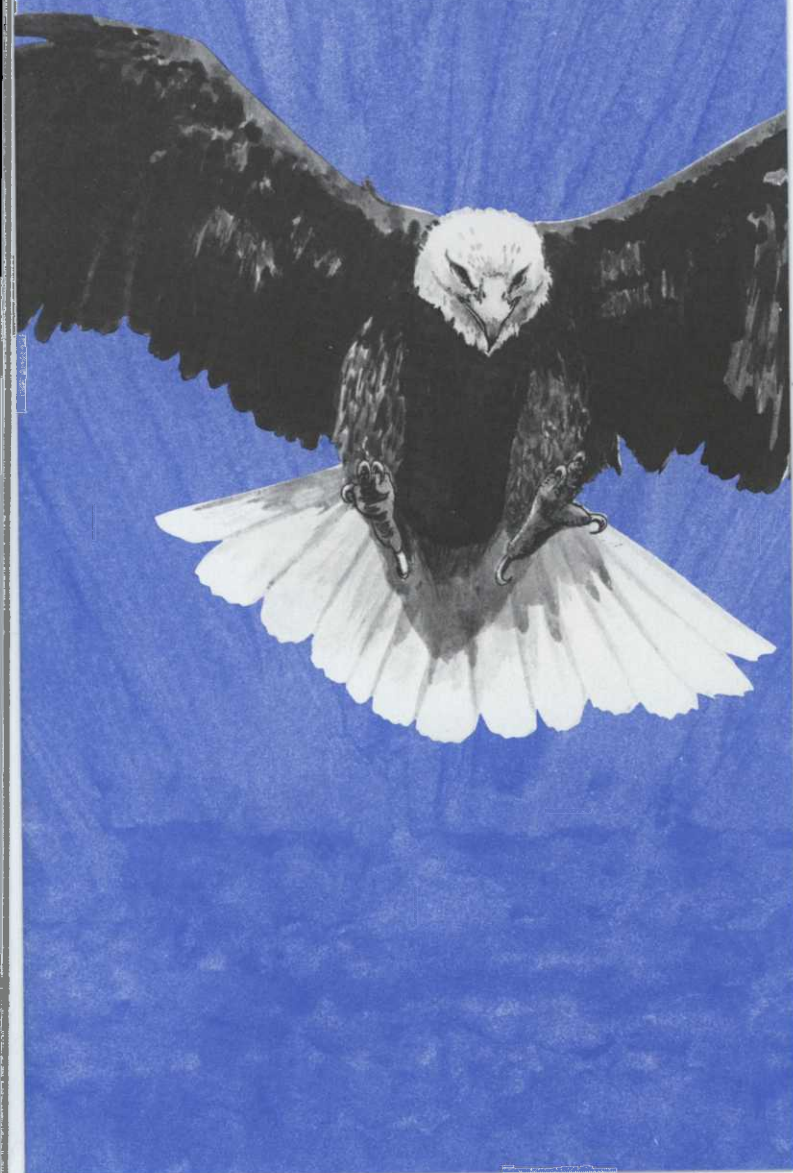



RF 6-64550-1



October, 1978

Karl E. Mundt
National Wildlife Refuge





An adult bald eagle soars majestically above the Missouri River breaks, its white head and tail sparkling in the crisp December sun. It peers downward, searching for prey. Suddenly, the eagle folds its wings and swoops downward in a mind-blurring, 100 mile-per hour dive. Checking his descent, the eagle skims above the Missouri's ice-blue waters and deftly thrusts a talon into the waters. He pulls up and wings toward a tall cottonwood tree carrying his breakfast, a silvery shad.

The eagle flares his wings and lands upon a gnarled limb. A scream of defiance warns potential intruders that this woodland is the realm of a bird of strength and courage — the symbol of our Nation.

Will future generations enjoy similar wildlife spectacles? Possibly not because the bald eagle faces the threat of extinction. Karl E. Mundt Refuge, the first Federal eagle sanctuary, is helping assure the perpetuation of the species.

HISTORY

In early times, eagles perched in timber which was found along the Missouri River. The wild river and its surrounding habitats yielded fish, waterfowl, and other wildlife which were preyed upon by eagles. Construction of dams converted the wild river into open lakes and destroyed the eagles' habitat.

Forced from their traditional haunts, the eagles searched for alternate wintering areas and some found the tail waters below the Ft. Randall Dam to their liking. In this open water they found an abundance of their favorite food — fish such as goldeye, shad, and white bass plus a variety of ducks and geese.

The eagles found excellent stands of mature cottonwood trees adjacent to the open water. This combination of abundant food and ideal roosting habitat proved successful and wintering eagle populations began to increase below the Ft. Randall Dam. In 1967, a peak of 283 eagles was reached establishing the Ft. Randall population of wintering eagles as the largest in the lower 48 states.

Although a portion of the wintering eagle flock roosted in woodlands managed by the U.S. Corps of Engineers, the main roosting areas were on private lands below Ft. Randall Dam. In order to preserve this National treasure, a project was launched by the 7-Eleven Food Stores Division of the Southland Corporation and the National Wildlife Federation.

Receipts generated by the sale of endangered species drinking cups were set aside in the "Save A Living Thing Project." The Southland Corporation raised \$250,000 which was transferred to the National Wildlife Federation. With these funds, the Federation purchased 780 acres of river bottom and obtained a perpetual easement which guaranteed the preservation of an additional 300 acres of important woodlands. Administration of the land was turned over to the U.S. Fish & Wildlife Service on December 19, 1974. The new refuge was named after the late Karl E. Mundt, a South Dakota Senator who was a strong supporter of the Endangered Species Act of 1966.

WILDLIFE

The refuge contains one of the last stretches of truly natural Missouri River bottomland. A wide variety of wild species utilize this unique habitat.

Countless thousands of ducks and geese frequent the refuge during the annual migrations, while water birds such as the ring-billed and Franklin's gulls, common and least terns, double-crested cormorants and white pelicans rest and feed along the wide Missouri.

Both whitetail and mule deer slip secretly through the dense woodlands, often shadowed by coyotes or bobcats.



A greater prairie chicken performs his springtime courtship ritual.
Photos by Gary Zahn, U.S.F.W.S.

Rio Grande turkeys roost in the towering cottonwoods, while raccoons, mink, skunks, foxes, and cottontails meander through the underbrush.

Along the woodland margins, flocks of ring-necked pheasants and bob-whites scratch for wild and cultivated seeds, while occasional red-tailed and ferruginous hawks watch from above, waiting for a chance to strike.

Dozens of species of songbirds native to the cottonwood-willow-dogwood habitat zone can be found on the refuge. During the spring migration and nesting season, the woods seem ablaze with striking colors as warblers, orioles, cardinals, grosbeaks, and bluejays dart through the treetops. Each spring, well-known songsters such as brown thrashers, mockingbirds, meadowlarks, and song sparrows fill the woods with nature's harmony.

Large flocks of mallard ducks spend the winter months on the Missouri River.



MANAGEMENT FOR DIVERSITY

Food plots containing corn, sorghum, wheat, and millet are planted by refuge managers to attract both migratory waterfowl and resident wildlife. These birds and animals are an alternate food source to the wintering eagles.

Cottonwoods are planted periodically to provide future eagle roosting habitat. Shelterbelts are also planted for resident wildlife species.

Two-hundred acres of native grasslands are grazed periodically to maintain the vigor of the grass and to add diversity to the river-breaks ecosystem. These mixed grass prairies contain a variety of unique wildflowers.

EAGLE HABITS

Small numbers of eagles begin to move onto the refuge during late October, with peak populations occurring during December and January. Immature eagles outnumber the whitehead adults during November, however, the December-January flock contains 70-80 percent adults.

During their winter stay, most eagles perch within 50 feet of the river-bank, preferring tall cottonwood trees in close proximity to the source of food. There appear to be five major communal roosts located within the Ft. Randall-Karl Mundt wintering area. Communal roosting promotes efficient exploitation of the food resources in the wintering

Mule deer inhabit the refuge uplands.



area and allows a maximum number of eagles to roost at sites protected from the chilling winter winds.

The eagles feed mainly on fish in the Ft. Randall Dam tailwaters during the morning hours. Mallards, rabbits, and pheasants are also eaten as the fish supply declines.

During late January and early February, many of the eagles begin to follow the waterfowl flocks which feed in private cornfields. The refuge eagle population quickly declines as the feeding eagles shift to several roosts throughout Charles Mix County. This eagle dispersal continues and, by mid-March, bald eagles become a rare sight on the refuge.

EAGLE WATCHING

Eagles will abandon their roosts if disturbed too much by humans. Therefore, public use on the Karl Mundt National Wildlife Refuge is prohibited. An excellent eagle observation point is located on Corps of Engineers property directly below the Ft. Randall Dam. From this observation point above the tailwaters, visitors can get close-up views of the eagles as they deftly pluck fish from the fast-flowing waters. Visitors should refrain from disturbing eagles perched among the cottonwoods during the mid-day loafing period.

EAGLES AND THE GOVERNMENT

The U.S. Fish and Wildlife Service has programs which address each of the major threats to eagles.

Habitat Destruction - The Service coordinates with other Federal agencies to prevent habitat losses caused by Federal development projects and by private developments which require Federal permits. Shooting, Trapping and Commerce - Law enforcement agents employed by the Service protect eagles from being shot, trapped, and commercially traded.

Pesticides - The U.S. Fish and Wildlife Service has conducted extensive research on the negative impacts that pesticides have on reproduction of several predatory birds. The Service monitors pesticide levels in the environment on a nationwide basis.

Electrocution - The Service cooperates with power companies to design power poles which will prevent electrocution of eagles.

EAGLES AND YOU

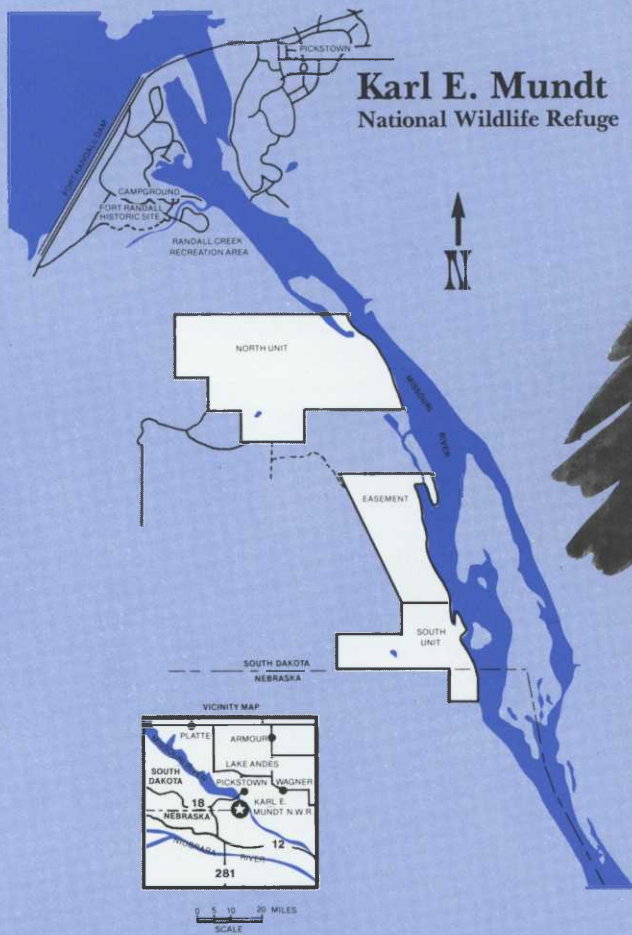
You can do a lot for eagles and other endangered wildlife by learning more about how they are protected. You can personally work to conserve endangered animals and plants by joining one of the many wildlife conservation organizations. You may also register your opinion when the Service makes proposals to add species to the endangered list and to designate critical habitat. You should report any violations of the laws protecting imperiled wildlife.



Bald eagle. U.S.F.W.S. photo by K. Kenyon.

EAGLE FACTS

- The bald eagle was officially listed as an endangered species in 1978.
- North America's bald eagle population is estimated at 90,000 to 136,000. Most of these are in Alaska.
- The male eagle is smaller than the female. The adult female has a wingspan of about 8 feet and weighs about 10 to 14 pounds. The male has a wingspan of about 7 feet and weighs about 8 to 10-1/2 pounds.
- The birds' scientific name, *Haliaeetus leucocephalus*, means "white-headed sea eagle".
- Eagles may live 30 years or more in the wild.
- Eagles have been clocked at speeds of over 100 miles per hour while diving on their prey.
- Eagles mate for life, returning to the same nest year after year.
- One to three eggs are laid, hatching in about 35 days. Normally, only one chick survives.
- Young learn to fly at three months of age and leave the nest when they reach their fourth month.
- The white head and tail feathers develop during the fourth or fifth year. Young birds may be mistaken for large hawks.



U.S. FISH AND WILDLIFE SERVICE
Department of the Interior



RF6-64550-1



October, 1979

☆ GPO: 1980-680-986